

# APPENDIX D 2011 MITIGATION ACTION ASSESSMENT MATRIX

## 2008 PROGRAMMATIC ACTIONS

Action #	Description	Action Completed	Action Removed	Action Remains Valid	Comment
US Virgin Islands-1	VITEMA to work with DPW to focus annual budget and priorities to remove built up sediment, debris and maintain natural guts, roadside ditches, drainage channels and storm drains in areas that are designated in this Plan as Repetitive Loss Mitigation Strategy (RLMS areas).			<input checked="" type="checkbox"/>	Revised Action: This programmatic action remains valid and has been rewritten to be more specific on the actions that are required by VITEMA and the implementing agency.
US Virgin Islands-2	Strengthen sediment and erosion control enforcement		<input checked="" type="checkbox"/>		Beyond capabilities of VITEMA to effect Policy in USVI
US Virgin Islands-3	Strengthen partnerships with the Office of the Governor and media to disseminate information to the general public on hazard mitigation programs and sustainable development concepts.			<input checked="" type="checkbox"/>	
US Virgin Islands-4	Publicize the availability of print material on hazard data and hazard mitigation tools to professional associations, interest groups, and the private sector.			<input checked="" type="checkbox"/>	
US Virgin Islands-5	Distribute and require the use of maps that were developed as part of the flood insurance study that delineate natural drainageways (guts) that exceed a specified cross-section or flow in cubic feet per second to appropriate DPNR and DPW staff responsible for development review or engineering design of flood drainage improvement works to prevent encroachment of new development or alteration of natural guts unless necessary for the correction of existing flooding problems.			<input checked="" type="checkbox"/>	
US Virgin Islands-6	Enforce existing VI code requirement restricting the cutting of trees or vegetation within 30 feet of the center of any natural watercourse, or within 25 feet of the edge of the watercourse, whichever is greater, unless special permission is obtained from the Commissioner of DPNR.		<input checked="" type="checkbox"/>		Beyond capabilities of VITEMA to effect DPNR code compliance; DPNR also is seriously understaffed.
US Virgin Islands-7	Integrate and strengthen environmental programs such as the Sediment Reduction Program, Unified Watershed Assessment and Restoration Priorities Program and the		<input checked="" type="checkbox"/>		Beyond capabilities of VITEMA to effect policy change, particular cross-cutting issues affecting a number of agencies

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	Non-point Source Pollution Program to help achieve flood hazard risk reduction.				in USVI
US Virgin Islands-8	Strengthen preservation and restoration programs of the natural coastline, wetlands, and sensitive environments that provide a natural buffer to the impacts of natural hazards.		<input checked="" type="checkbox"/>		Capacity issues at VITEMA preclude implementing this action in the near term.
US Virgin Islands-9	Prohibit development or new construction in V-Zones unless it serves a clearly defined water dependant use.		<input checked="" type="checkbox"/>		Beyond VITEMA capacity to effect policy and regulatory changes in the near term
US Virgin Islands-10	Amend coastal zone legislation to extend the coastal zone inland to include contiguous areas of Special Flood Hazard Areas (SFHAs) and other designated hazard prone areas.		<input checked="" type="checkbox"/>		Beyond VITEMA capacity to effect Territorial legislative changes in the near term
US Virgin Islands-11	Update and approve the draft Comprehensive Land & Water Use Plan to incorporate a hazard mitigation perspective		<input checked="" type="checkbox"/>		
US Virgin Islands-12	Perform an assessment of zoning and subdivision regulations with emphasis given to development densities, stormwater management, environmental protection, coastal zone, and flooding concerns.		<input checked="" type="checkbox"/>		Beyond VITEMA capacity to effect Territorial policy and regulatory changes for the near term
US Virgin Islands-13	Amend subdivision regulations to incorporate current floodplain management techniques and create a formal administrative review process that addresses potential.		<input checked="" type="checkbox"/>		Beyond VITEMA capacity to effect Territorial policy and regulatory changes for the near term
US Virgin Islands-14	Amend the zoning ordinance to reduce the development densities where they are too high, especially in natural hazard areas.		<input checked="" type="checkbox"/>		
US Virgin Islands-15	Include hazard mitigation as one evaluation criterion when preparing and adopting Capital Improvement Plans.		<input checked="" type="checkbox"/>		Too much interagency coordination required to move this action forward in the near term
US Virgin Islands-16	Develop site design and construction specifications that require the design consultant to address hazard mitigation concerns for new public facility construction projects.		<input checked="" type="checkbox"/>		
US Virgin	Establish standard guidelines and		<input checked="" type="checkbox"/>		

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Islands-17	specifications that address hazard risk reduction in the design and construction of public and private roads, particularly standards relating to conveyance of stormwater in culverts, roadside ditches and under bridges.				
US Virgin Islands-18	Establish and maintain a catalog of executive agency emergency management plans which contains strategies, actions, and procedures to resume the business operations and functions in the event of a natural hazard in the event of all facilities owned, leased or otherwise occupied by the USVI Government.		<input checked="" type="checkbox"/>		Limited VITEMA capacity for 2011 Plan Update timeframe
US Virgin Islands-19	Provide technical support to state agencies for continuity planning with a special emphasis on on-going and continuing mitigation planning efforts		<input checked="" type="checkbox"/>		
US Virgin Islands -20	Develop worksheets for Government agency facility managers to gather relevant information necessary to support applications to seek federal hazard mitigation funding where appropriate.			<input checked="" type="checkbox"/>	
US Virgin Islands-21	Conduct structural engineering assessments and prepare concept designs and cost estimates to retrofit top priority critical facilities, and identify pre-disaster funding sources such as FEMA PDM, CDBG, among other potential Federal funding sources.		<input checked="" type="checkbox"/>		Limited availability of funding anticipated during 2011 Plan timeframe
US Virgin Islands-22	Develop conceptual retrofit or relocation mitigation projects, including preliminary cost estimates, for retrofitting or relocating essential infrastructure and critical facilities that can be undertaken following a future disaster event (primarily hazard mitigation funding sources – PDMC, HMGP, etc.).			<input checked="" type="checkbox"/>	
US Virgin Islands-23	Hire and maintain technical staff to adequate levels to provide technical assistance to any Government agency/authority that could be an eligible grantee or subgrantee for federal grant programs.		<input checked="" type="checkbox"/>		
US Virgin Islands- 24	Construct a database management program and develop procedures to collect information on and to track <b>repetitive loss</b>			<input checked="" type="checkbox"/>	

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	<b>properties</b> in the Territory				
US Virgin Islands-25	Define and implement arrangements for the collection of data on <b>Landslides</b> that can affect the Territory, including information on location (maps), history, and probability of hazard events.			<input checked="" type="checkbox"/>	
US Virgin Islands-26	Define and implement arrangements for the collection of data on the <b>Wildfire</b> that can affect the Territory, including information on location (maps), history, and probability of hazard events.			<input checked="" type="checkbox"/>	
US Virgin Islands-27	Define and implement arrangements for the collection of data on <b>Coastal Erosion</b> that can affect the Territory, including information on location (maps), history, and probability of hazard events.		<input checked="" type="checkbox"/>		This hazard has been addressed and enough readily available data exists about the history and frequency of this hazard in the USVI. (see NOAA on-line database of hazard events)
US Virgin Islands-28	Define and implement arrangements for the collection of data on <b>Drought</b> that can affect the Territory, including information on location (maps), history, and probability of hazard events.			<input checked="" type="checkbox"/>	
US Virgin Islands-29	Construct a database management program and develop procedures to track mitigation project progress and effectiveness from project award to project completion so as to provide a record on the aggregate actual costs avoided of implemented mitigation projects in the territory.			<input checked="" type="checkbox"/>	
US Virgin Islands-30	Create a methodology and formal reporting procedures to be provided to HMGP or other mitigation grant recipients in order to calculate the benefits/costs for each implemented mitigation project		<input checked="" type="checkbox"/>		
US Virgin Islands-31	Conduct follow-up activities to engage members of the hazard mitigation committee in annual review of planning and implementation activities under their agency's responsibility			<input checked="" type="checkbox"/>	Revised action: The action has been re-written to re-direct responsibilities to the island hazard mitigation committees.

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## 2008 ISLAND SPECIFIC ACTIONS, ST. THOMAS

Action #	Description	Action Completed	Action Removed	Action Remains Valid	Comment
STT-1	Construct Lindberg Estates, Phase IV Drainage Project north through Kirwin Terrace Public Housing Units.			<input checked="" type="checkbox"/>	
STT-2	Pursue road reconstruction and drainage improvements to resolve recurrent flooding on Commandant Gade Gut (Garden Street) from Bunker Hill to Veterans Drive that affect businesses and emergency access.			<input checked="" type="checkbox"/>	Repetitive Loss Mitigation Strategy (RLMS) area
STT-3	Pursue road reconstruction and drainage improvements to resolve recurrent shallow flooding on Radets Gade from Main Street to Veterans Drive that affect businesses.			<input checked="" type="checkbox"/>	RLMS area
STT-4	Pursue road reconstruction and drainage improvements to resolve recurrent shallow flooding on Storre Tvaer Gade from Main Street to Veterans Drive that affect businesses.			<input checked="" type="checkbox"/>	
STT-5	Improve drainage infrastructure along Rt. 30 Estate Hope / Fortuna to eliminate flooding of nearby residences in Fortuna 3C Subdivision.				
STT-6	Construct drainage improvements on Rt. 30 adjacent to Bolongo Bay.			<input checked="" type="checkbox"/>	RLMS area
STT-7	Pursue Phase II of the downtown sidewalk improvement project and integrate stormwater improvements in the shopping district of Charlotte Amalie.	<input checked="" type="checkbox"/>			This action has been implemented with federal highway funding
STT-8	Construct drainage improvements on Rt. 32 to Red Hook Road from East End café to Ferry Terminal to resolve recurrent shallow flooding events that primarily affect businesses and	<input checked="" type="checkbox"/>			This action has been implemented with federal highway funding

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	emergency access.				
STT-9	Pursue the acquisition of land for the relocation of the Downtown Fire Station that is susceptible to storm surges and tsunamis.			<input checked="" type="checkbox"/>	Land for relocation identified, now seeking funds for construction of new station
STT-10	Perform an assessment for the reactivation and reconstruction of the island reservoir system to provide water supply to residents during hazard events.		<input checked="" type="checkbox"/>		This action is beyond the technical and financial capabilities of VITEMA, involves capital improvement budget USVI government.
STT- 11	Expand and reinforce communication Infrastructure being installed by BIT to mitigate hurricane-strength winds and ensure rapid return to normal service.			<input checked="" type="checkbox"/>	Revised action: has been re-written to focus on public communication infrastructure installed by BIT
STT-12	Enlarge box culverts, stormdrains, and improvements to open channels from Veterans Drive to the Bay along the east edge of Frenchtown in southwest Charlotte Amalie (Frenchtown Drainage East), in order to resolve flooding, traffic access and business interruption, by providing 100-year flood protection.			<input checked="" type="checkbox"/>	RLMS area
STT-13	Implement drainage improvements to resolve the flooding problems at Coki Point and Smith Bay Roads, and, improvements to open channels draining through the Resort Complex into Water Bay (Smith Bay Basin) to resolve localized flooding problems that periodically close roads, create traffic hazards, prevent emergency vehicle and public access, and cause damage to adjacent businesses and road pavement.			<input checked="" type="checkbox"/>	
STT-14	Construct drainage improvements to secondary road that provides access to Caret Bay West. Improvements			<input checked="" type="checkbox"/>	

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	could include paving and/or providing proper roadside drainage and properly-sized culverts where appropriate to carry stormwater across the road to minimize erosion of the road surface.				
STT-15	Design and install new, parallel underway pipeline carrying electric, water and communications service from Charlotte Amalie waterfront to Water Island.		<input checked="" type="checkbox"/>		This action is beyond the technical and financial capabilities of VITEMA, requires action by USVI government through capital improvement budget.
STT-16	Harden WAPA Substations. Design and construction of hardened switchgear buildings at the East End and Tutu Substations.			<input checked="" type="checkbox"/>	
STT-17	Resolve flooding problems at Subbase Entrance. Pursue Phase II drainage improvements which include the installation of properly-sized culverts from Bellows across Veterans Drive to connect to Phase I drainage improvements.			<input checked="" type="checkbox"/>	Compounded problem during times of high tides
STT-18	Complete Installation of Hurricane Shutters at main police station in Charlotte Amalie.			<input checked="" type="checkbox"/>	
STT-19	Improve drainage infrastructure along Hospital Gade from Antonio Jarvis School to the Police Station on Verteran's Drive, paying particular attention to the intersection of Hospital and Kongens Gade (Moravian Church and Zoras).			<input checked="" type="checkbox"/>	
STT-20	Replace and improve drainage infrastructure along Rt. 33 (Estate Dorothea).			<input checked="" type="checkbox"/>	
STT-21	Replace and improve drainage infrastructure at Food Center in order			<input checked="" type="checkbox"/>	

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	to resolve flooding of roads, businesses, while addressing potential secondary impacts to wetlands.				



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## 2008 ISLAND SPECIFIC ACTIONS, ST. CROIX

Action #	Description	Action Completed	Action Removed	Action Remains Valid	Comment
STX-1	Pursue Christiansted Gut USACE Section 205 Project. Preliminary feasibility phase currently underway by the Corps to determine whether technically feasible and cost effective solutions exist to reduce flood damages in residential and business areas adjacent to King Cross Street. The Corps will prepare a Detailed Project Report describing their findings and can provide up to 50 percent funding for structural solutions and up to 65 percent for nonstructural control measures.			<input checked="" type="checkbox"/>	
STX-2	Perform assessment of the drainage basin north of Estate Williams Delight to identify the direction of water flow to determine technically feasible and cost effective structural solutions to the flooding problems on Queen Mary Highway and Melvin H. Evans Highway.			<input checked="" type="checkbox"/>	Phase 1 drainage improvements completed; Phase 2 in design phase
STX-3	Perform assessment of flooding problems within La Grande Princess Estate. Approximately 50 of 250 NFIP-insured losses in St. Croix (one in five repetitive losses) occur in La Grande Princess. Eighty two properties were identified as being in the 100 year flood plain and the potential for acquisition, structural solutions, and nonstructural control measures to reduce repetitive losses to residences should be assessed.			<input checked="" type="checkbox"/>	RLMS area
STX-4	Perform assessment of flooding problems within Mon Bijou Estate. Approximately 50 of 250 NFIP-insured losses in St. Croix (one in five		<input checked="" type="checkbox"/>		Drainage improvements completed; some NFIP structures may still be at risk. RMLS area

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	repetitive losses) occur in Mon Bijou Estate. One hundred and sixty-eight properties were identified as being in the 100 year flood plain and the potential for acquisition, structural solutions, and nonstructural control measures to reduce repetitive losses to residences should be assessed.				
STX-5	Conduct a hydrological study of the Christiansted watershed or catchment area with particular attention given to the sub-watersheds of Spring Gut and Water Gut to determine technically feasible and cost effective structural solutions to the flooding problem in Christiansted.			<input checked="" type="checkbox"/>	
STX-6	Resolve flooding problems and improve stormwater drainage infrastructure for "Spring Gut" all the way to Gallows Bay.			<input checked="" type="checkbox"/>	
STX-7	Resolve flooding problems and improve stormwater drainage infrastructure for Tide Village by implementing a low water crossing to divert surface run-off into the natural gut.			<input checked="" type="checkbox"/>	
STX-8	Construct drainage system along Melvin H. Evans in the area west of Williams Delight Stop Light and Carlton. Extend drainage system to connect with drainage improvements in Williams Delight Community.			<input checked="" type="checkbox"/>	
STX-9	Construct a retention pond at the property line of White Bay and the National Park Service reserve within the localized depression.			<input checked="" type="checkbox"/>	NEPA compliance issue owing to drainage easement needed on Federal lands
STX-10	Install storm shutters at the Henry Rolshen Airport	<input checked="" type="checkbox"/>			

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STX-11	Construct Large Pad Transformers replace pole mounted transformers to pad mounted transformers to mitigate damages from hurricanes and ensure rapid recovery and return to normal service.			<input checked="" type="checkbox"/>	
STX-12	Construct Feeders 2, 3, 4, 6, 9 & 10. Underground feeders from Richmond Substation to various termination points to mitigate damages from hurricanes and ensure rapid recovery and return to normal service.	<input checked="" type="checkbox"/>			Implemented under HMGP
STX-13	Construct Richmond Substation 24.9 kV Switchgear Building. Design and construction of new switchgear and relocation of feeders connection from present switch yard to new low profile high voltage enclosed switchgear, and removal of existing substation. The 24.9 kV distribution system supplies the western portion of the island including numerous critical facilities. Benefits include providing all hazards protection including transportation and port security to this critical substation.	<input checked="" type="checkbox"/>			Implemented under HMGP
STX-14	Pursue equipment anchoring program for the Richmond Electrical Generating Plant. Anchor critical equipment in the Plant to mitigate damages caused by earthquake, hurricane-strength winds, tsunami and storm surge.			<input checked="" type="checkbox"/>	
STX-15	Construct drainage improvements at the Ricardo Richards Elementary School at Estate Barren Spot near Melvin H. Evans Highway (Route 66).			<input checked="" type="checkbox"/>	
STX-16	Improve Water Distribution Pump Stations at Concordia and Adventure.			<input checked="" type="checkbox"/>	
STX-17	Conduct feasibility study and			<input checked="" type="checkbox"/>	

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	implement and provide emergency power generator units for all pumping stations on St. Croix.				
STX-18	Improve Richmond and Recovery Hill Water Storage Tanks. Install wind girders to reinforce against hurricane storm winds.			<input checked="" type="checkbox"/>	Revised Action: has been re-written to include only Recovery Hill. Richmond Water Storage Tank hardening completed.
STX-19	Improve Various Water Storage Tanks throughout the island. Install flexible connectors at multiple water storage tanks to permit pipe flexibility during earthquake events and ensure rapid recovery and normal service.			<input checked="" type="checkbox"/>	Low cost mitigation measure

## 2008 ISLAND SPECIFIC ACTIONS, ST. JOHN

Action #	Description	Action Completed	Action Removed	Action Remains Valid	Comment
STJ-1	Pursue Public/Private Sector initiative to resolve localized flooding problem on Westin Hotel property and adjacent public road. Several new, properly-sized culverts are required.	<input checked="" type="checkbox"/>			Implemented
STJ-2	Construct drainage improvements to eliminate localized flooding at the lower end of "Carolina Gut" at Little Plantation (Across from Dominos Gas Station) where natural storm flows in the catchment area have been altered by construction and improper siting of structures.			<input checked="" type="checkbox"/>	

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STJ-3	Construct drainage improvements to eliminate localized flooding at Pond Mouth at intersection of Rt. 102 and Rt. 105				
STJ-4	Conduct a hydrological study of the Coral Bay watershed or catchment area with particular attention given to the sub-watersheds of Johnny Horn Trail and Kingshill (Carolina Gut) to determine technically feasible and cost effective structural solutions to the flooding problem in Coral Bay.	<input checked="" type="checkbox"/>			Implemented through a NOAA sponsored program
STJ-5	Construct drainage improvements to eliminate localized flooding along Route 107 southbound in Coral Bay (Estate Carolina).			<input checked="" type="checkbox"/>	RLMS area.
STJ-6	Pursue the reconstruction of the Bordeaux Mountain Road to Coral Bay to ensure emergency access from Cruz Bay to Coral Bay during periodic road closure.		<input checked="" type="checkbox"/>		Beyond capabilities of VITEMA to implement over the next several years
STJ-7	Office of the Governor/VITEMA/DPW/National Park Service perform assessment to explore the possibilities of developing an alternate "southside" route from Cruz Bay to Coral Bay to ensure emergency access to Coral Bay during periodic road closure.		<input checked="" type="checkbox"/>		Beyond capabilities of VITEMA to implement over the next several years
STJ-8	Increase fuel capacity of the Myra Keating Health Clinic Emergency power generator unit.			<input checked="" type="checkbox"/>	
STJ-9	Provide an alternate power generation substation for Coral Bay to ensure that there is power source or all public services and critical facilities on the east end of the island.			<input checked="" type="checkbox"/>	
STJ-10	Improve drainage infrastructure (Box Culverts) at WAPA building and			<input checked="" type="checkbox"/>	

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	treatment plant, while addressing potential secondary impacts to wetlands.				
STJ-11	Perform an assessment for to identify appropriate slope stabilization projects to eliminate slope failures along Centerline Road.			<input checked="" type="checkbox"/>	These actions remain valid and have been combined into one mitigation action for the 2011 Plan Update
STJ-12	Pursue a DPW mitigation project to eliminate slope failures along Centerline Road (Between Mile 6 and Mile 7 and (Between Reef Bay and Mile 5)) that periodically closes the road during major storm events.			<input checked="" type="checkbox"/>	
STJ-13	Construct underground feeders from the St. John substation to various termination points within Cruz Bay to mitigate damages to hurricane winds and ensure rapid recovery and return to normal service.			<input checked="" type="checkbox"/>	
STJ-14	Coordinate with the National Park Service for the construction of appropriate drainage system improvements to eliminate localized flooding along Route Rt. 20 in Maho Bay.			<input checked="" type="checkbox"/>	

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